

What is Claimed Is:

1. In a spray gun of the type for spraying paint and similar coatings on a target surface, the improvement comprising a range finder in combination with the spray gun, wherein the range finder provides a user of the gun with information about the distance between the gun and the target surface.
2. The apparatus of claim 1 wherein the information provided by the range finder enables the user to position the gun at a desired distance from the target surface.
3. The apparatus of claim 2 wherein the range finder provides information in the form of a first visually perceptible image when the gun is at the desired distance from the target surface.
4. The apparatus of claim 3 wherein the range finder provides information in the form of a second visually perceptible image when the gun is less than the desired distance from the target surface.
5. The apparatus of claim 4 wherein the range finder provides information in the form of a third visually perceptible image when the gun is more than the desired distance from the target surface.
6. The apparatus of claim 5 wherein each of the first, second, and third visually perceptible images are different from each other.
7. The apparatus of claim 1 wherein the range finder projects a pair of illuminated images on the target surface.
8. The apparatus of claim 7 wherein each of the pair of illuminated images are offset with respect to each other.

9. The apparatus of claim 7 wherein the pair of illuminated images are aligned along a predetermined axis with each other when the gun is at the desired distance from the target surface.

10. The apparatus of claim 9 wherein each of the pair of illuminated images are offset from the predetermined axis when the gun is not at the desired distance from the target surface.

11. The apparatus of claim 10 wherein the illuminated images are offset in a first relationship with respect to each other when the gun is at a position less than the desired distance from the target.

12. The apparatus of claim 10 wherein the illuminated images are offset in a second relationship with respect to each other when the gun is at a position greater than the desired distance from the target.

13. The apparatus of claim 7 wherein at least one of the illuminated images is a spot.

14. The apparatus of claim 7 wherein each of the illuminated images is a spot.

15. The apparatus of claim 14 wherein the spots are vertically offset from each other.

16. The apparatus of claim 15 wherein the spots are vertically aligned when the gun is at the desired distance from the target surface.

17. The apparatus of claim 15 wherein the spots are vertically aligned when the gun is at the desired distance and oriented generally perpendicularly to the target surface.
18. The apparatus of claim 15 wherein one spot is positioned to the right of the other spot when the gun is closer than the desired distance to the target surface.
19. The apparatus of claim 15 wherein one spot is positioned to the right of the other spot when the gun is oriented generally perpendicularly to the target surface and closer than the desired distance to the target surface.
20. The apparatus of claim 18 wherein the one spot is positioned to the left of the other spot when the gun is greater than the desired distance to the target surface.
21. The apparatus of claim 18 wherein the one spot is positioned to the left of the other spot when the gun is oriented generally perpendicularly to the target surface and greater than the desired distance to the target surface.
22. The apparatus of claim 7 wherein the range finder uses at least one laser light source to project the pair of illuminated images.
23. The apparatus of claim 22 wherein the at least one laser light source includes at least one laser diode having a diverging output beam, and at least one focusing lens positioned to converge the diverging output beam to a beam waist and adjusted to locate the beam waist in a plane corresponding to the target surface when the spray gun is at the desired distance from the target surface.
24. The apparatus of claim 2 wherein the information provided by the range finder is a visually perceptible image delivered at a readout on the gun.

25. The apparatus of claim 24 wherein the visually perceptible image includes a first state indicative of the gun being positioned at the desired distance from the target surface.

26. The apparatus of claim 25 wherein the visually perceptible image includes a second state indicative of the gun being positioned at less than the desired distance from the target surface.

27. The apparatus of claim 26 wherein the visually perceptible image includes a third state indicative of the gun being positioned at greater than the desired distance from the target surface.

28. The apparatus of claim 24 wherein the visually perceptible image comprises a display on the readout of an actual distance between the gun and the target surface.

29. The apparatus of claim 24 wherein the readout comprises one or more optical indicators and the visually perceptible image comprises selective illumination of one or more states of the one or more optical indicators.

30. The apparatus of claim 29 wherein the readout comprises at least one optical indicator having at least three visually distinguishable states, with each of the states corresponding to one of the positions of the gun at, closer to, or farther from the desired distance with respect to the target surface.

31. The apparatus of claim 2 wherein the information provided by the range finder includes an audible signal.

32. The apparatus of claim 31 wherein the audible signal has at least two states, with a first state corresponding to a position of the gun closer than the desired

distance to the target surface and a second state corresponding to the gun greater than the desired distance from the target surface.

33. An optical positioning system for a spray gun comprising means for providing a pair of spaced-apart optical beams originating from the spray gun and aimed in a direction of material sprayed by the spray gun, wherein the beams illuminate a target surface with a predetermined pattern when the spray gun is at a desired distance from the target surface.

34 The optical positioning system of claim 33 wherein the means for providing the pair of spaced-apart optical beams comprises an optical light source and a beam splitter located downstream of the optical light source dividing the light from the optical light source into the pair of spaced-apart beams.

35 The optical positioning system of claim 33 wherein the means for providing the pair of spaced-apart optical beams comprises a pair of optical light sources.

36. The system of claim 33 wherein the beams are at least generally collimated.

37. The system of claim 33 wherein the means for providing the pair of spaced-apart optical beams includes at least one laser diode.

38. The system of claim 33 wherein the optical beams comprise light within the visible spectrum.

39. The system of claim 33 wherein the optical beams are offset from each other.

40. A positioning system for a spray gun comprising:

- a. an ultrasonic range finder located in a spray gun and providing a signal indicative of a distance measured between the spray gun and a target surface at which the gun is aimed; and
- b. a range indicator connected to the signal provided by the ultrasonic range finder to provide a perceptible indication of the distance measured.

41. The positioning system of claim 40 wherein the perceptible indication of the distance measured includes a first state corresponding to a condition wherein the distance measured equals a desired distance to the target surface.

42. The positioning system of claim 41 wherein the perceptible indication of the distance measured includes a second state corresponding to a condition wherein the distance measured is less than a desired distance to the target surface.

43. The positioning system of claim 41 wherein the perceptible indication of the distance measured includes a third state corresponding to a condition wherein the distance measured is greater than a desired distance to the target surface.

44. The positioning system of claim 40 wherein the range indicator provides the perceptible indication in a visible form.

45. The positioning system of claim 44 wherein the range indicator provides a visually perceptible digital display of the distance measured.

46. The positioning system of claim 45 wherein the visually perceptible digital display is a numerical readout of the distance measured.

47. The positioning system of claim 45 wherein the visually perceptible digital display is a bar graph display of the distance measured.

48. The positioning system of claim 40 wherein the perceptible indication comprises an audibly differentiable indication.

49. The positioning system of claim 48 wherein the audibly differentiable indication comprises three states corresponding, respectively, to the distance measured being generally equal to, less than, or greater than a desired distance to the target surface.

50. A method of positioning a spray gun at a desired distance away from a target surface, the method comprising:

- a. illuminating a pair of spots on a target surface by directing a first beam of visible light and a second beam of visible light emitted from spaced apart locations on a spray gun, wherein the first and second beams are angled to approach one another;
- b. bringing the pair of illuminated spots to a predetermined alignment pattern on the target surface to position the gun at the desired distance; and
- c. causing the spray gun to deliver coating material to the target surface while maintaining the gun substantially at the desired distance by keeping the illuminated spots substantially in the predetermined alignment pattern by moving the spray gun generally parallel to the target surface substantially at the desired distance.

51. The method of claim 50 wherein the beams are offset sufficiently to be at least partially separated from each other at the desired distance.

52. The method of claim 50 wherein the beams are offset sufficiently such that the beams do not touch one another regardless of the distance to the target surface.

53. The method of claim 50 wherein the beams are offset vertically from each other such that the illuminated spots are vertically offset from each other when the spray gun is positioned at the desired distance from the target surface.

54. The method of claim 50 wherein step a. further comprises focusing the visible light to maximize the intensity of the illuminated spots at the desired distance.

55. The method of claim 50 wherein step a. further comprises using a single laser light source to generate the visible light and directing the visible light from the laser light source into a beam splitter located downstream of the laser light source to provide the first and second beams.

56. The method of claim 50 wherein step a. further comprises using a first laser light source to provide the first beam and a second laser light source to provide the second beam.